Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-2. (Cancelled)

3. (Currently Amended) The method of claim [[1]] 33 wherein the first composition is a composition that is soluble in at least one solvent and wherein the first composition is removed from the green body by contacting the green body with the solvent.

4. (Original) The method of claim 3 wherein the solvent is water.

5. (Currently Amended) The method of claim [[1]] 33 wherein the first composition is a thermally degradable composition and wherein the first composition is removed from the green body by heating to a temperature and for a time effective for removing the first composition.

6. (Currently Amended) The method of claim [[1]] 33 wherein the second composition is selected from the group consisting of ceramic oxides, ceramic carbides, ceramic nitrides, ceramic borides, ceramic silicides, metals, and intermetallics, and combinations thereof.

7. (Original) The method of claim 6 wherein the second composition is silicon carbide.

8. (Currently Amended) The method of claim [[1]] 33 wherein the second composition includes a material effective for enhancing the thermal conductivity of the heat exchanger.

9. (Previously presented) The method of claim 8 wherein the material is a nano additive selected from the group consisting of carbon black, carbon, silicon carbide, carbon nanotubes and nano fibers.

10. (Previously presented) The method of claim 9 wherein the nano additive is present in an amount of between about two to about five weight percent based on the weight of the second composition.

11. (Currently Amended) The method of claim [[1]] 33 wherein the method includes depositing a thin layer of a material on an outer surface of the heat exchanger to enhance the thermal conductivity of the heat exchanger.

12. (Original) The method of claim 11 wherein the layer of material is deposited by a chemical vapor deposition process.

13. (Currently Amended) The method of claim [[1]] 33 wherein the method includes depositing a metallic layer onto a surface of the heat exchanger by a metallization process.

14. (Currently Amended) The method of claim [[1]] 33 wherein the method includes integrally forming one or more external protrusions on the green body.

15-26. (Canceled)

27. (Currently Amended) The method of claim [[1]] 33 wherein the channels have inner diameters of between about 50 microns to about 2000 microns.

28. (Previously presented) The method of claim 27 wherein the inner diameters of the channels are between about 50 to about 100 microns.

29. (Currently Amended) The method of claim [[1]] 33 wherein the channels are arranged in the same direction.

30. (Currently Amended) The method of claim [[1]] 33 wherein the filaments are arranged in two or more layers and at least two adjacent layers are arranged with the filaments positioned at 90° to one another to provide a heat exchanger having multi-directional channels.

31. (Currently Amended) The method of claim [[1]] 33 wherein the channels are curved.

32. (Currently Amended) The method of claim [[1]] 33, further comprising:

(d) connecting a first manifold to a first wall of the heat exchanger; and

(e) connecting a second manifold to a second wall of the heat exchanger.

33. (New) A method comprising:

(a) simultaneously co-extruding a first composition and a second composition to form a plurality of two-component filaments, each filament including the first composition encased in the second composition;

(b) depositing the filaments onto a working surface in a plurality of layers, in a predetermined orientation, using a computer-controlled deposition mechanism, to provide a green body;

(c) subjecting the green body to conditions effective for removing the first composition from the filaments and for sintering the second composition to provide a heat exchanger including a plurality of channels having walls made of the sintered second composition for containing coolant flow, the channels having inner diameters of no more than about 2000 microns.

34. (New) The method of claim 33 wherein each layer of the green body has a geometry corresponding to a horizontal cross section of the heat exchanger.

35. (New) A method comprising:

(a) forming a feed rod from a first composition and a second composition, the feed rod including the first composition encased in the second composition;

(b) extruding the feed rod through a deposition nozzle onto a working surface in a plurality of layers, in a predetermined orientation, by mechanically manipulating at least one of the deposition nozzle and the working surface, to provide a green body formed of a plurality of two-component filaments, each filament including the first composition encased in the second composition;

(c) subjecting the green body to conditions effective for removing the first composition from the filaments and for sintering the second composition to provide a heat exchanger including a plurality of channels having walls made of the sintered second composition for containing coolant flow, the channels having inner diameters of no more than about 2000 microns.

36. (New) The method of claim 35 wherein each layer of the green body has a geometry corresponding to a horizontal cross section of the heat exchanger.

37. (New) A method comprising:

(a) simultaneously co-extruding a first composition and a second composition to form a plurality of two-component filaments, each filament including the first composition encased in the second composition;

(b) arranging the filaments on a working surface to form a plurality of layers, in a predetermined orientation, to provide a green body;

(c) subjecting the green body to conditions effective for removing the first composition from the filaments and for sintering the second composition to provide a heat exchanger including a plurality of channels having walls made of the sintered second composition for containing coolant flow, the channels having inner diameters of no more than about 2000 microns, wherein each layer formed of the deposited filaments has a geometry corresponding to a horizontal cross section of the heat exchanger.

38. (New) The method of claim 37 wherein the filaments are arranged by depositing the filaments onto the working surface using a computer-controlled deposition mechanism.

39. (New) The method of claim 38 wherein the computer-controlled deposition mechanism deposits the filaments in the predetermined orientation based on a CAD drawing of the green body.